DOCUMENT RESUME

ED 103 357 SP 008 962

AUTHOR Reynolds, Carl H.; Gentile, J. Ronald
TITLE Performance Under Traditional and Mastery Assessment Procedures in Relation to Students' Locus of Control: A Possible Aptitude by Treatment Interaction.
PUB DATE 75
NOTE 12p.

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS *Academic Achievement; College Students; *Individualized Instruction; *Individualized Programs; Learning Activities; *Locus of Control; Performance Based Teacher Education; *Teacher Education

ABSTRACT

Previous research in locus of control (LC) suggested the hypothesis that internal Ss should perform better under mastery than under traditional assessment procedures, while the reverse should be true of externals. Two experiments were conducted using undergraduate and graduate Ss. Neither the LC nor the assessment procedure main effects were significant in either study, and no interaction was found with the undergraduates. With graduate Ss there was a significant interaction opposite in direction to expectations. Ss overwhelmingly preferred the mastery procedures. These results are harmful to the construct validity of the I-E Scale (Rotter, 1966) and supportive of the mastery learning approach. (Author)

BEST COPY AVAILABLE

PERFORMANCE UNDER TRADITIONAL AND MASTERY ASSESSMENT PROCEDURES IN RELATION TO STUDENT'S LOCUS OF CONTROL: A POSSIBLE APTITUDE BY TREATMENT INTERACTION

PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL HAS BEEN GRANTED BY
Carl H. Reynolds
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER.

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED103357

Carl H. Reynolds and J. Ronald Gentile

Boston College and State University of New York at Buffalo

One of the most salient differences between mastery learning (Block, 1971) and traditional educational practice is the amount of control exercised by the student over the educational process. Under a mastery approach the student can usually study at his own pace, decide when he is ready to test his mastery of the material, and determine to a large extent his own course grade. In contrast, under a traditional approach the student must perform more at the instructor's rate and may have less control over his course grade, especially if norm-referenced assessment is being used. The authors were interested in studying this situational difference in the student's control over events important to him as it interacted with the personality construct of locus of control (LC). LC is conceived as a generalized expectancy regarding the control of one's reinforcements (Rotter, 1966). A person with an internal LC feels, in general, that he himself is in control of the delivery of his own rewards and punishments. A person with an external LC believes that his reinforcements are regulated by external forces such as luck, powerful others, fate, etc.

Hersch and Scheibe (1967), Phares (1965), and Tseng (1970) found that internals were more proficient or effective in various situations than externals, and Seeman and Evans (1962) and Seeman (1963) found that internals were more likely than externals to seek out information relevant to their needs. Lefcourt, Lewis, and Silverman (1968), Rotter and Mulry (1965), and Schneider (1968) all reported finding that internals preferred, or took more

SP008 962

© 1975

BEST COPY AVAILABLE

seriously, situations in which they perceived themselves to be in control, and Watson and Baumal (1967) found that internals made fewer errors in a perceived skill than in a perceived chance situation. The reverse findings were true of externals in each of the latter four studies.

In light of the above evidence, the authors hypothesized 1) that internal Ss would prefer an assessment system based on mastery learning to a traditional assessment approach, while the reverse would be true of externals, and 2) that internal Ss would perform better in a mastery learning than in a traditional assessment format, while the reverse would be true of externals. Thus, these research hypotheses provided a test of an aptitude by treatment interaction (ATI; e.g., Bracht, 1970; Cronbach and Snow, 1969). In addition to or instead of the predicted interactions, either a LC main effect in favor of internals or a course format main effect in favor of the mastery approach would not have been unexpected. An effect of the former type might be interpreted as a consequence of the motivational effects of a belief in one's effectiveness, while an effect of the latter type might be attributed to the greater opportunity afforded the student in a mastery learning system for testing his knowledge against stated objectives.

Method

Two similar experiments were conducted to test the interaction hypotheses. Experiment I involved 76 undergraduate student teachers enrolled in a required course in educational psychology, and Experiment II involved 44 graduate students in a similar graduate level course. Both courses were designed and supervised by the second author, and both were divided by content into four consecutive segments: classroom applications of reinforcement principles, the psychology of discipline, the relationships of beliefs and attitudes to behavior, and measurement and mastery learning theory. Examinations for each unit were scheduled at fixed times, and all students took the same form

BEST COPY AVAILABLE

of the test at that time. For students in the traditional format, the score on that test constituted the basis for a letter grade on that unit. Students in the mastery format had to demonstrate competence in the unit, defined as achieving a score of 80% or more. If the student did not demonstrate competence, he was apprised of his areas of weakness by the instructor or a course assistant and helped to learn the material. When the student felt prepared to demonstrate his mastery of the material, he was given an alternate form of the same test. This process continued until the student achieved mastery.

Experiment II also included a third assessment condition, termed modified mastery, wherein Ss who failed initially to attain mastery of the unit were given the option of not restudying the material and not taking another mastery test. Such Ss could simply accept a C, say, rather than learn the material to the specified criterion. In this condition, then, students had even more control over the conduct of the course than in the mastery condition.

In Experiment I Ss were assigned to take two segments under the traditional course format and two under the mastery learning format. In Experiment II students were assigned to take one of the first three units of instruction under the traditional course format, one under the mastery learning course format, and one under the modified mastery course format. Ss were allowed to choose the format they preferred for the last unit. Experiment II analyses were based only on the first three units of instruction, since the Ss were randomly assigned to conditions for those units only.

All students were pre- and posttested on an instrument which covered all four units of instruction, and which included a number of items assessing attitudes toward the subject matter and teaching. The I-E Scale (Rotter, 1966) was administered during the pretest to measure LC. Each student's standard

BEST COPY AVAILABLE

score on the section of the posttest corresponding to the unit he took under each assessment condition was employed as the dependent variable in an analysis of covariance. In Experiment I there were two scores for the mastery and two scores for the traditional format. The two similar scores were combined for use as the dependent variable. Students were trichotomized on the basis of I-E Scale scores in Experiment I and dichotomized on the same basis in Experiment II. LC was a between Ss factor while assessment condition was a within Ss factor. In all analyses pretest score was controlled.

Results

Both the I-E Scale and the posttest instrument showed adequate reliability in both experiments (I-E Scale: I = .79, II = .81; posttest: I = .59, II = .74). The students, regardless of LC group, overwhelmingly preferred the mastery assessment procedures (I = 68%, II = 70%) to either the modified mastery (I = 26%, II = 30%) or the traditional (I & II = 0%) procedures. Since the Experiment I Ss did not themselves experience the modified mastery procedure, it was presented as a hypothetical alternative. In Experiment II, we had a strong behavioral measure of assessment procedure preference, since the students were allowed to choose the format they preferred for the last unit. Twenty-five (57%) chose the mastery procedures, eighteen (41%) chose the modified mastery conditions, and one (2%) chose the traditional assessment procedure. We believe this decisive preference for the mastery approach should carry some weight with course planners.

No main effect for LC or course format was observed in either study, and no significant interaction was found in Experiment I. In Experiment II a significant ($p < .06$) LC by course format interaction was found, but it was opposite in direction to the hypothesis! As shown in Figure 1, internals

BEST COPY AVAILABLE

Insert Figure 1 about here

---

did better under the traditional course format while externals performed better under mastery conditions. The theory of LC clearly predicted the hypothesized interaction, but in Experiment I no interaction was found, and in Experiment II an interaction opposite in direction to the hypothesis was found. These contradictory results suggest a need for replication, but both experiments agreed in failing to confirm the hypothesis. In neither experiment were there any significant differences between LC groups with respect to preference for assessment procedures. Overwhelming preference for the mastery approach was the rule regardless of I-E Scale score.

The cognitive impact of the course was demonstrated by highly significant ($p < .01$) changes in performance from pre- to posttest. In the first experiment the mean improvement amounted to 2.5 pretest standard deviations, and in the second experiment an improvement of 3.0 pretest standard deviations was noted.

To assess the affective impact of the course, a sign test (Siegel, 1956) was performed on the 12 items included in the pre- and posttests which assessed the Ss' attitudes toward the subject matter and teaching. In both experiments a significant ($p < .01$) positive shift was observed in the attitudes of these Ss toward the concepts and principles of the course and their applications to teaching.

Thus, while the course had powerful cognitive and affective effects, neither LC nor assessment condition had a significant effect, and the hypothesized interaction failed to appear.

Discussion

Several explanations may be advanced to account for the data. Originally, those who promulgated the LC construct hypothesized that it would be strongly

BEST COPY AVAILABLE

related to n-achievement (Rotter, Seeman, & Liverant, 1962), which, one would expect, would lead to school achievement. Perhaps, however, LC simply is not a powerful variable in school situations. Rotter (1966) and Warehime (1972) have suggested as much in efforts to account for the fact that the I-E Scale seems to be unrelated to school GPA. The hypothesis of a relationship between LC and n-achievement has also fared poorly. Wolk and DuCette (1971) found no significant correlation between the I-E Scale and two measures of n-achievement in two samples of Ss.

Another possible explanation of the findings is that the I-E Scale assesses socio-political attitudes rather than an underlying personality dimension with motivational consequences. The responses to the I-E Scale which indicate an internal LC usually emphasize individualism and success through hard work. Such responses should be congenial to those of conservative socio-political philosophy. On the other hand, external responses often emphasize collectivism and common oppression by greater powers. These responses probably fit well in the world-view of many liberal thinkers. Indeed, Thomas (1970) found that although his sample of 30 liberals was more politically active than his sample of 30 conservatives, the liberals were significantly more external than the conservatives.

If the I-E Scale measures socio-political philosophy, the interaction found in the second experiment is readily explained. If the externals are liberals, they should prefer the more liberal course formats, while the conservative internals should prefer the traditional instructional methods. This is exactly what was found in Experiment II.

However interpreted, the results of these experiments are damaging to the construct validity of the I-E Scale. Further experimentation should be undertaken to resolve the discrepancies between the results of the two studies, but there is no evidence in either experiment of the

BEST COPY AVAILABLE

interaction predicted by LC theory.

The finding of most import for education was that both undergraduate and graduate students showed an overwhelming preference for the mastery learning format. Since the students learned the material equally well under all of the assessment procedures, the authors believe this result argues strongly in favor of the mastery learning approach.

BEST COPY AVAILABLE

References

Block, J. H. (Ed.) Mastery Learning: Theory and Practice. N.Y.: Holt, Rinehart & Winston, 1971.

Bracht, G. H. Experimental factors related to aptitude-treatment interactions. Review of Educational Research, 1970, 40, 627-645.

Cronbach, L. J., & Snow, R. E. Individual differences in learning ability as a function of instructional variables. Final Report. ERIC Document No. Ed 029 001, U.S. Office of Education, March, 1969.

Hersen, P. D., & Scheibe, K. E. Reliability and validity of internal-external control as a personality dimension. Journal of Consulting Psychology, 1967, 31, 609-613.

Lefcourt, H. M., Lewis, L., & Silverman, I. W. Internal versus external control of reinforcement and attention in a decision making task. Journal of Personality, 1968, 36, 663-682.

Phares, E. J. Internal-external control as a determinant of amount of social influence exerted. Journal of Personality and Social Psychology, 1965, 2, 642-647.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, Whole No. 609.

Rotter, J. B., & Mulry, R. C. Internal vs. external control of reinforcement and decision time. Journal of Personality and Social Psychology, 1965, 2, 598-604.

Rotter, J. B., Seeman, M., & Liverant, S. Internal versus external control of reinforcement: A major variable in behavior theory. In N. Washburne (Ed.), Decisions, Values and Groups. N.Y.: Pergamon Press, 1962. Pp. 473-516.

Schneider, J. M. Skill versus chance activity preference and locus of control. Journal of Consulting and Clinical Psychology, 1968, 32, 333-337.

BEST COPY AVAILABLE

Seeman, M. Alienation and social learning in a reformatory. American Journal of Sociology, 1963, 69, 270-284.

Seeman, M., & Evans, J. W. Alienation and learning in a hospital setting. American Sociological Review, 1962, 27, 772-782.

Siegel, S. Nonparametric Statistics. N.Y.: McGraw-Hill, 1956.

Thomas, L. E. The I-E Scale, ideological bias, and political participation. Journal of Personality, 1970, 38, 273-286.

Tseng, M. S. Locus of control as a determinant of job proficiency, employability, and training satisfaction of vocational rehabilitation clients. Journal of Counseling Psychology, 1970, 17, 487-491.

Warehime, R. G. Generalized expectancy for locus of control and academic performance. Psychological Reports, 1972, 30, 314.

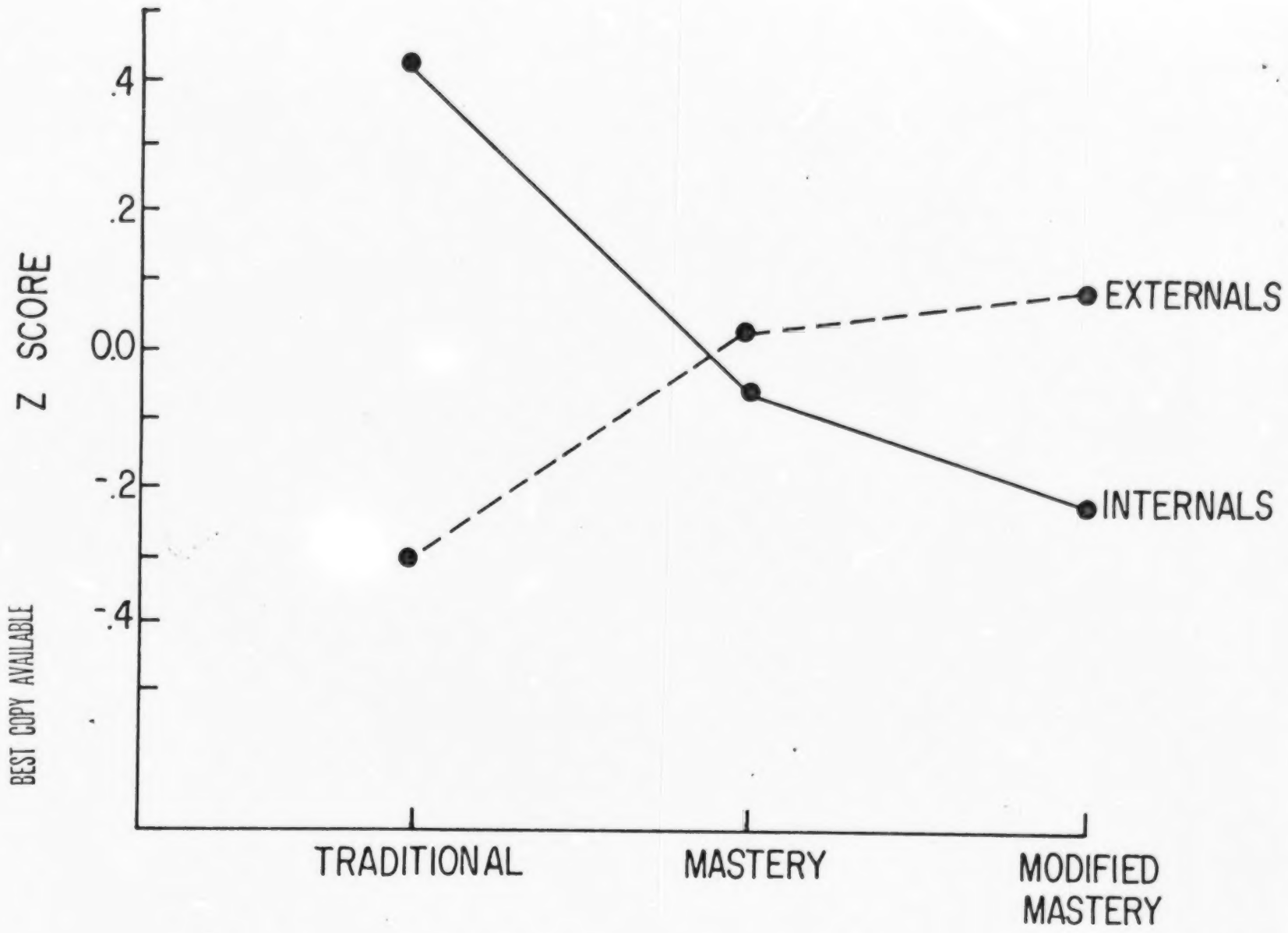
Watson, D., & Baumal, E. Effects of locus of control and expectation of future control upon present performance. Journal of Personality and Social Psychology, 1967, 6, 212-215.

Wolk, S., & DuCette, J. Locus of control and achievement motivation: Theoretical overlap and methodological divergence. Psychological Reports, 1971, 29, 755-758.

BEST COPY AVAILABLE

Figure Captions

Fig. 1. Posttest performances of internals and externals in the different course formats.



BEST COPY AVAILABLE